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ABSTRACT

A review and analysis of Educational Resources Information Center (ERIC) publications and non-ERIC publications was made to assess availability and identify major findings, promising developments, strategies, and methodological strengths and weaknesses which exist in curricula designed for preparing food industry workers. Project national figures and trends reveal that there is a need for educational programs to prepare students to enter food serving, marketing, and processing occupations. However, data concerning personnel needs in a specific employment area should be used to determine if there is a need for these programs. While a number of curricula are available to prepare students for a single occupation or a cluster of occupations, improvements are needed and changes will be necessary. Curricula should be developed and evaluated through an educational planning system composed of occupational analysis, program planning, program development and testing, and documentation and dissemination of results. To provide and train the necessary workers, improved counseling and recruiting materials are needed. The bibliography includes ERIC availability and ordering information for microfiche and hard copy reproduction. (SE)

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Information

Series No. 32

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review and analysis of curricula for

OCCUPATIONS IN FOOD PROCESSING AND DISTRIBUTION

ERIC

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REVIEW AND ANALYSIS OF CURRICULA FOR OCCUPATIONS IN FOOD PROCESSING AND DISTRIBUTION

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PREFACE

This *Review and Analysis of Curricula for Occupations in Food Processing and Distribution* is one of a series of information analysis papers in vocational and technical education and related fields. It should aid curriculum development specialists, researchers, and practitioners in assessing the current "state of the art" in the field. The compact nature of the review should be of assistance to practitioners in identifying current curriculum offerings and useful materials to improve operating programs. It should also assist in identifying voids in our present research and development framework and enhance future studies, both in terms of their substantive focus and methodological approaches.

Where ERIC document numbers and ERIC Document Reproduction Service (EDRS) prices are cited, the documents are available in microfiche and hard copy forms.

The profession is indebted to Wiley B. Lewis, Virginia Polytechnic Institute and State University for his scholarship in the preparation of this report. Recognition is also due Arthur Jensen, director, Vocational Education Media Center, Clemson University; and Thomas White, Vocational Education, Indiana University, for their critical review of the manuscript prior to its final revision and publication. J. David McCracken, information specialist at The Center, coordinated the publication's development.

Members of the profession are invited to suggest specific topics or problems for future reviews.

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INTRODUCTION

Job openings in food processing and distribution occupations are expected to show a rapid numerical increase during the 1970's. Though an increasing concern toward the attainment of the national goals listed by Lecht (1968) is influencing this increase, the need for personnel in these occupations is being created by several socioeconomic, political, and scientific factors. Among these, the most important are:

1. Population growth which results in a need to provide foodstuffs to a greater number of people;
2. Public expectations include more and better foods which are more evenly distributed among the various segments of the population;
3. Government involvement in planning and implementing Federal food programs and in providing financial support has given a greater number of people access to more and better foods;
4. Expansion in scientific knowledge has improved our ability to produce, process, market, and serve food, making the provision of more and better foods possible; and
5. Private and public costs resulting from undernourished persons are being recognized as a hindrance to socioeconomic development.

These factors have contributed to the development of a need for additional food processing and distribution facilities, and personnel to meet the growing demands for food services. Decreasing the gap between the potentialities of the modern food technologies and the availability of high-quality food service to Americans is an important national objective. The lack of an adequate supply of trained production or distribution manpower can frustrate the attainment of high priority national objectives in this and many other fields.

Food processing and distribution job openings of interest in this analysis will center around occupations in which the worker's performance is directed toward the processing, marketing, or serving of foodstuffs. Occupations in these categories, important during the 1970's, generally will bear titles similar to those occupations existing today; and the tasks performed and the material and procedures used will undergo only limited revision. Basic information concerning most of these occupations is contained in the *Dictionary of Occupational Titles, 1965* (nd) and its supplements. Another publication with contains information related to these occupations is *Vocational Education and Occupations* (U.S. Department of Health, Education, and Welfare, Office of Education and U.S. Department of Labor, Manpower Administration, 1969).

A rapidly growing demand for food processing and distribution, hereinafter referred to collectively as food industry, personnel, coupled with the current situation of a slowly increasing supply has two principal implications for planning in vocational education. First, the rapid expansion in required food industry services means a parallel expansion in a broad

spectrum of needs for trained food workers. Second, it implies an expanding base of job opportunities for individuals in the "left out" groups in American society.

Statement of the Problem

Projected demands for increased numbers of food industry workers have resulted in a need to synthesize information related to the training of skilled workers for food industry occupations, with special emphasis directed toward curricula for emerging occupations. As new technological and scientific findings are developed, many existing occupational curricula will require revision or completely new approaches. Thus, providing instruction in the occupational areas important in the 1970's will be a challenge to those persons responsible for the programs. This analysis of literature related to food industry occupations was undertaken in an effort to help these individuals:

1. Assess the availability and current development of curricula, materials, and guides for their development and use;
2. Identify promising developments and findings in food industry occupational areas; and
3. Identify and describe the major conclusions and future research and development alternatives.

To help in meeting these needs, the remainder of this report will be directed toward accomplishing the following objectives:

1. To determine to what extent educational programs are needed, and if so, identify which occupational areas require instructional emphasis;
2. To determine to what extent curricula and curriculum materials are available at present for use in preparing students for occupational areas identified as important;
3. To identify the techniques and procedures used for developing available curricula and for providing instruction; and
4. To identify the techniques and procedures which should be used for developing curricula and for providing instruction in the future.

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REVIEW AND ANALYSIS OF CURRICULA FOR OCCUPATIONS IN FOOD PROCESSING AND DISTRIBUTION

REVIEW AND ANALYSIS OF THE LITERATURE

Publications and documents listed in the bibliography were reviewed and analyzed in an effort to identify the major findings, promising developments, strategies, and methodological strengths and weaknesses which exist in curricula designed for preparing food industry workers. Such a review and analysis was believed to be important to those persons responsible for educational programs related to food industry occupations.

Need for Educational Programs

Killingsworth has noted that "the great paradox of this age of affluence is a great surplus of low skilled workers coexisting with shortages of skilled workers" (Riessman, nd). To alleviate this situation, programs should be devised and initiated to prepare low skilled workers for employment in available occupations or efforts should be made to redesign the occupational structure to utilize individuals with lower skill levels.

The relatively large number of job openings expected in food industry occupations during the 1970's indicate a need for the preparation of increased numbers of skilled workers. However, worker needs in the processing area during the 1970's are not well defined. Though specific figures related to these needs were not available, several authors expressed a growing need for processing workers. Simpson (1970) noted that "with the population increasing at a rapid rate, the food processing industry and food processing technologists have a bright future." Koene (1970) wrote he "... anticipated that there will be more job opportunities than graduates based on current experience." The current situation was summarized by Olmstead (1970) who wrote that "the demand for ... graduates still far exceeds the supply." As a result of these statements from persons associated with educational programs for processing occupations, it is believed that present education programs should be expanded and that the number of such programs be increased. Such changes are necessary to provide trained personnel for employment opportunities in such occupations as production management or supervision, quality control, grading and inspection, fieldwork, product distribution, and actual processing operations.

The number of workers employed in the marketing area is expected to increase. Lecht (1968) indicated that based upon the projected percentage of increase in employment, stock clerks and storekeepers were in high growth occupations while salesmen and sales clerks were in low growth occupations. Because of this, continued emphasis should be placed upon preparing students for employment in marketing occupations related to the food industry. While salesmen and sales clerks represent the low growth occupational category, the expected numerical employee requirement due to replacement of workers who retire or leave this job for other reasons, plus the increase in employment opportunities justify such a conclusion.

Workers in the third occupational group, food service, are expected to exhibit a rapid increase in number during the coming decade. Information in *Tomorrow's Manpower Needs* (U.S. Department of Labor, Bureau of Labor Statistics, nd) indicated that the number of food service workers would increase from 1,737,000 in 1960 to 2,638,000 in 1975. In the publication, *Job Guide for Young Workers, 1969-70 Edition* (U.S. Department of Labor, Manpower Administration, nd), it was estimated that 640,000 job openings for waiters and waitresses would occur during the next ten years. Projections in this same booklet predicted that thousands of food-service workers such as bus boys, car hops, countermen, fountainmen, cook helpers, and kitchen helpers would be needed during this same period.

Projections in the *Occupational Outlook Handbook, 1970-71 Edition* (U.S. Department of Labor, Bureau of Labor Statistics, nd) showed that 30,000 cooks and chefs would be needed each year to replace those lost through retirement and death alone. Additional figures showed that 44,000 waiters and waitresses would be needed annually due to retirements and deaths in this occupational area. The need for workers in these categories also was recognized by Lecht (1968) who listed cooks and waiters as high growth occupations, based upon expected percentages of increase in employment.

As a result of these projected national figures and trends, it may be concluded, and rightly so, that there is a need for educational programs to prepare students to enter the occupations related to each of the occupational groups—processing, marketing, and serving. However, data concerning personnel needs in the employment area should be used in determining if there is a need for these programs rather than basing such decisions upon national information alone. In determining if a local need exists, a procedure for determining the vocational education needs through a community analysis as described by Cromer (1968) should be considered.

Vertical worker mobility appears to have received little attention in the various segments of the food industry. The only reference to such movement was found in material in the *Job Guide for Young Workers, 1969-70 Edition* (U.S. Department of Labor, Manpower Administration, nd) which indicated that such movement was possible for waiters and waitresses. Because of the limited consideration given to this concept, persons with an interest in these occupational areas such as administrators, workers, educators, and government officials should attempt to develop specific career ladders through special job training, remedial education programs, and changes in occupational and employment standards.

Present vocational education programs related to food industry occupations are designed principally for high school students. There is a need to expand the number of programs available on this level, and an effort should be made to organize additional programs at the high school and post-secondary levels for adults. The national policy of increasing and upgrading employment opportunities for the disadvantaged implies an increased emphasis on adult programs in food industry occupations.

In preparing individuals for these occupations, vocational education as described in the Vocational Education Amendments of 1968, exists side-by-side with other training systems designed for preparing individuals for employment. These systems include programs conducted under the auspices of the Manpower Development and Training Act (MDTA), the Job Corps, the Armed Forces, post-high school institutions, proprietory schools, and public and private agencies. But even though all of these systems are preparing potential employees, the number of trained workers is inadequate. As a result, vocational education must remain a viable force in this area.

High school vocational education courses can provide pre-employment training and encourage students to remain in school and acquire credentials suitable for entrance into food industry occupations or other specialized training programs. Vocational education along with the other educational programs also has provided basic education and occupational training courses needed to serve the needs of unemployed workers or workers whose job skills have been made obsolete by socioeconomic and technological changes. While increased educational opportunities are imperative, it must be realized that a period of time will be required before all workers entering food industry occupations will have the opportunity to participate in some type of formal job training.

Curricula and Curriculum Materials

Educators have emphasized the importance of a curriculum by calling it the "backbone" of the instructional process. Vocational teachers use it to chart the course from meager student interest and knowledge of a vocation or cluster of vocations to achievement of the goal of employment. The success of the instructional program is determined principally by the extent to which it contributes to this goal.

Because the curriculum is important, a common understanding of its meaning should be established. The term has been defined many ways but according to Leighbody it "is the sum total of the learning experiences for which the school has responsibility, whether they occur in school or not" (*Papers Presented at the National Conference on Curriculum Development in Vocational and Technical Education,* 1969). It should provide an outline of the practical training and related instruction required for the acquisition of a specific level of skill and knowledge in a particular occupation or cluster of occupations. With this as a basis, appropriate literature was reviewed to determine the availability of curricula for food industry occupations.

For these occupations, a great number of curricula were found and reviewed. These curricula were designed to be used for preparing students for a single occupation or a cluster of occupations. For example, *Family Dinner Service Specialist, A Suggested Training Program* (1964) was designed solely for preparing specialists to prepare and serve dinners for employed people, retired persons, or families desiring such service. On the

other hand, *Food Processing Technology, A Suggested 2-Year Post High School Curriculum* (Knoebel and Others, 1967) was developed to meet basic student needs related to many areas of the food processing industry including those of laboratory technician, plant manager, assistant chemist, research technician, salesman, and inspector.

This review of available literature revealed that curricula were available for the several occupations presently recognized in each of the occupational categories—food processing, food marketing, and food service—of interest in this review. Included in these were curricula for use in training personnel for food service occupations including those employed as waitresses; hostesses; salad girls; lunch counter waitresses (*Suggested Guide. Training Program for Food Service Occupations,* 1965); meatcutters (Karnes, 1965 and Massey and Steakley, 1967); poultry processing employees (Dooley and Williams, 1967); dairy products employees (Blaschke and Page, 1967); meat inspectors and laboratory animal caretakers (Mayer, 1968); food irradiation technicians (Stiles, 1969); supermarket management personnel (Haynes, 1968); commercial food workers such as cook assistants, grill assistants, baker helpers, salad girls, stock boys, waiters or waitresses, and bus boys (Dommer, 1967); supermarket merchandising employees (Gradoni, 1967); waiters and waitresses (*Waiter—Waitress; A Suggested Guide for a Training Course,* 1969 and *Food Service Selling, Instruction Manual,* 1965); hospital food service workers (Peay, 1969); and food store managers (*Food Store Operating Procedures; Parts 1 and 2,* 1966).

Curricula included in the review generally were designed for one of two groups of individuals—adults (pre-employment or post-employment) and high school students. Though instruction for these groups is interrelated, curricula should be prepared for the type of student being served as well as job requirements. The curriculum outlined in *A Sample Earning Training Program For; "Waitress Training"* (Shubert, nd) was designed for use with high school students to prepare them for entry into occupations involving knowledge and skills in food service; while McDonough's (1967) pre-employment curriculum for waiters, waitresses, counter attendants, and food service workers is designed for adults enrolled in programs conducted as part of Manpower Development Training. Material presented in *Outline for the Preparatory Course in Occupational Home Economics in the Field of Food Services (Preparation and Management)* (1966) was recommended for use in planning preparatory food service courses for both secondary and adult students.

In addition to curricula, other curriculum materials were identified during the review and analysis. These materials were selected on the basis of Olivo's (Larson and Blake, 1969) definition of curriculum materials. He stated that "curriculum materials in vocational education refer to all the audiovisual sensory teaching-learning materials and devices used by the teacher and/or learner to teach or to master effectively and efficiently the skills, technologies, and general areas of learning required as a worker and as a citizen."

Workbooks, study guides, instructional guides and reference materials were found to be available for food industry occupations. Items reviewed which were placed in this classification included Breithaupt's *Commercial Cooking for Prospective Hotel and Restaurant Workers* (1963), *Training the Food Service Worker; Instructor's Guide* (1967), *Being a Food Service Worker; Student Manual* (1967), *The Food Processing Industry* (1968), *Milk Processing Plant Employee Course of Study* (1967), *Meat Cutting, A Study Guide and Progression Record for Meat Cutting Students in a Co-operative Training Program* (1964), *Modern Supermarket Operation* (1965), *Stocking, Marking, and Displaying for Food Stores* (1965), and *Produce—Care, Preparation and Merchandising* (1965).

In addition to these types of publications, programmed units were found for use in many of the occupational areas. Konz and Middleton (1967) reported preparing programmed learning "packages" for tasks identified in the food service industry, while *Self-Study Program in Retail Store Operations, Units 1-13 and Study Guide* (1965) contains programmed units related to supermarket operation. Another programmed unit identified was Blyth and Alter's *Programmed Instruction Course for the Distributive Education Student; Successful Retail Salesmanship* (1967).

While suggestions for planning facilities generally were available, information related to program standards was lacking. It appears that much emphasis needs to be placed on this area of the program. Much helpful information related to these items might be secured from organizations associated with each of the occupational areas—organizations of merchants, salesmen, or restaurant owners and workers.

Though many references were made to curriculum materials such as film, television systems, projectors, and transparancies in the material reviewed; several curricula did not include consideration of these items. Because of this, it is very probable that "the media have been treated as addenda, as interesting appendages, instead of as the bricks from which actual curricula experiences are built" (Finn and Others, 1967). Such materials should receive greater consideration in planning future educational programs.

It should not be considered impossible to obtain materials such as curricula, curriculum materials, or standards if they are not included in the bibliography. Many materials of this type were prepared locally and/or on a limited budget and were not available for distribution. Leighbody reported that there is no way to know how much instructional material of this kind—syllabi or content documents—exists because it is usually not available for distribution (*Papers Presented at the National Conference on Curriculum Development in Vocational and Technical Education,* 1969). This lack of distribution may have caused a duplication of effort in that other persons had to prepare similar materials so that they would be available for immediate use. Such duplication was observed in some of the occupational areas, especially those related to waiters and waitresses.

Though extra effort was required, one should consider that generally it is recommended that those persons associated with a program participate in developing the curriculum. If vocational teachers are to contribute as

they should to curriculum improvement, they must participate, on a continuing basis, in curriculum development. A team composed of teachers of related subjects, researchers, and specialists from the field of work should be involved (*A Guide for the Development of Curriculum in Vocational and Technical Education,* 1969).

Caution should be exercised in selecting and using materials related to food industry occupations. Each of the items reviewed was prepared for use with specific groups of people and this must be considered. In addition, consideration should be given to the fact that while many of the items reviewed were prepared only a few years ago, scientific developments may have resulted in these publications containing inaccurate information. Furthermore, because of the many sources from which such materials may be obtained, care should be exercised to secure instructional material from a reliable and competent source.

Curriculum Development

Present practices and procedures related to curricula development should be considered as a basis for developing curricula for food industry occupations. To discover the procedures and techniques used in developing curricula, it was considered necessary to review curricula, curriculum materials, and research reports. An attempt also was made to identify needed revisions in these procedures and techniques.

Analyses for Curriculum Development

Larson (1969) wrote that "curriculum development based on employment needs is the essence of effective payroll education for the youth and adult in today's world." Since this belief generally is accepted by vocational educators, job analysis has been used for many years as the basis for curriculum development in vocational education. Statements in the literature reviewed for this report indicated that this technique had been used for curriculum development in food industry education.

Because of continued and increasing employment needs, job analysis—the process of studying the operations, duties, and organizational relationships of jobs to obtain data for reporting the significant worker's activities and requirements—will continue to be an important part of such development. However, such analysis will be conducted under stricter guidelines and controls.

Job analysis was considered as being important in several of the materials reviewed. A job analysis model was presented in *Instructional Materials for Occupational Home Economics; Food Service Area* (1967) and job analysis forms were included in *Institute for Home Economics Teachers on Initiating, Developing, and Evaluating Programs at the Post High School Level to Prepare Food Service Supervisors and Assistants to Directors of Child Care Services: Volume I: A Post High School Program in Home Economics* (1967). In addition, Kneeland (nd) discussed the techniques of job analysis as they related to executive and supervisory person-

nel in distributive occupations. Yagi and his associates (1968) also recognized the value of such analysis in the design and evaluation of vocational technical education curricula.

A second type of analysis which has been used in developing curricula for food industry occupations is task analysis. This type of analysis is a method or process by which a task, a subunit of a job, is examined and its characteristics, in terms of certain attributes, are identified. Chenzoff defined a task as a "collection of activities that are; performed by one person, bounded by two events, directed toward achieving a single objective or output, and describable by means of the method set forth so that the resulting task description conveys enough information about the task to permit the necessary training decisions to be made" (Larson, 1969). Welch recommended this type of analysis be used in his publication *A Task Unit Concept for On-the-job Training in Food Service* (1966). Mager and Beach (1967) suggested that this type of analysis be used as a basis from which to develop a course.

The third type of analysis which is sometimes used for developing curricula is occupational analysis. This type involves techniques similar to those of job or task analysis but the scope of the research is much greater. Occupational analysis has been described by Borow as the application of a systematic method of obtaining information focused on occupations and industries as well as on jobs, tasks, and positions (Larson, 1969).

Each of these three types of analysis has been used in developing curricula for food industry occupations. In reviewing and analyzing the techniques used in developing available curricula, this writer could not establish clear differences between the procedures which were reported as being used. The existence of this condition agrees with Larson's (1969) statement that prositive distinctions between and among the characteristics of the various systems of analysis are often difficult to establish, primarily because of the overlapping in the application of terms.

Tuckman (1968) has introduced a fourth type of analysis—structural analysis. This type of analysis is a systematic approach to curriculum development, representing an attempt to organize terminal performance objectives for a unit of subject matter into a sequence of prerequisite competencies which must be mastered satisfactorily if successful performance is to occur. It involves asking the question: "What competencies must a person already possess in order to obtain a satisfactory performance level on some specified objective, given no instruction beyond those definitions specific to the objective in question?" By asking this question of all identified competencies, a hierarchy of requisite competencies is generated which parallels the learning process appropriate to the final task.

Regardless of which type of analysis is selected for a particular situation, it is evident that some form of analysis generally has been used as the basis for analyzing the work performed by individuals in food industry occupations. How are data for such an analysis collected? The material reviewed and analyzed showed that a variety of methods have been used. These methods included mail surveys, interviews, observations, analyses of documents such as curricula and textbooks, and committees composed of

persons associated with the occupations. The major portion of the curricula reviewed was developed by securing analysis information from educators and/or administrators and having the results reviewed by a specialist in the occupational area. While this type of analysis has proved effective in the past, more sophisticated methods will need to be employed in the future. More emphasis will be directed toward obtaining data from persons closely associated with the occupation and applying stringent guidelines and decision rules.

Simulation

Realism is important but the high cost of equipment and facilities, the space required for realistic training, and the potential danger in some food industry occupations made it difficult to provide suitable educational programs. This is especially true for occupations such as processing and merchandising. Simulation is one possible method which has been used to alleviate this situation.

Simulation is the creation of a situation which could occur in real life, usually with the variables simplified, for the purpose of instruction (Tansey and Unwin, 1968). Such simulation would help to bridge the gap between practical knowledge and purely theoretical knowledge, and make training available to a greater number of people. Buck and Monroe (1969) reported that simulation:

1. Begins with a devised set of circumstances,
2. Provides for low risk input,
3. Feeds back consequences symbolically, and
4. Is replicable.

This technique could be used to greater advantage in all of the occupational training programs though it is being used in present programs. For example, McDonough (1967) reported using practical application or a form of role playing in preparing food service workers.

Systems Approach

Curriculum building in vocational education is taking on a systems approach in an effort to expand the usefulness of the various types of analyses described earlier. The systems approach is "a 'closed-loop' analytic and developmental process which can be utilized to continuously: (1) assess the results of performance; (2) maintain sensitivity to performance requirements; and (3) provide for the self-correction of performance in order that the specified objectives can be achieved" (Miller, 1967). This approach involves analysis, and further extends the development process by requiring performance objectives along with an educational strategy to meet these objectives. It also requires that selection criteria for students be established. According to Miller (1969), this last step is important, for unless the student has the proper educational background and personality characteristics, the drop-out rate will be high. Mager and Beach (1967) recognized the value for such criteria in their publication, *Developing Vocational Instruction.*

Mention of this approach to curriculum development in food industry occupations was not found in the curricula reviewed. In addition, no curricula or studies reviewed contained material which indicated behavioral objectives were considered important. Though personnel associated with educational programs related to the food industries have failed to recognize the importance of such objectives, Mager (1962) suggested criteria for use in developing these objectives in his book, *Preparing Instructional Objectives.*

Consideration of selection criteria appears to be of little importance in food industry occupations. While material was reviewed concerning general occupational information such as *Job Guide for Young Workers, 1969-70 Edition* and the *Occupational Outlook Handbook* (U.S. Department of Labor, nd), more specific criteria were not recognized as being important. Because there is an apparent lack of specific criteria, efforts should be made to develop and distribute such items for the various occupations for student, counselor, and teacher use. Criteria should be prepared for high school, adult, and disadvantaged students in an effort to promote entry of these individuals into food industry occupations.

Broad Training Base

Many of the curricula reviewed were prepared for narrow occupational categories though efforts have been made to employ the cluster concept in preparing curricula for vocational education programs in food industry occupations. While the terms cluster concept and core curricula were not identified in the material reviewed, many of the curricula were designed to prepare students for employment in several occupations and actually constituted a core curriculum. The curriculum recommended by Knoebel and his associates (1967) is actually this type of curriculum. Under this concept, students enrolled in the program would receive a broad base of training which would help make them mobile and flexible in a job situation and provide increased employment opportunities and opportunities to grow (Maley, 1966). Employment of the core concept might result in greater vertical mobility or initiation of the "ladder concept." This is important so that students will not necessarily end up in dead-end positions or unemployed, but will have the opportunity to advance or seek other employment.

Curriculum Materials

Curriculum materials have been treated as an important part of curriculum development but more emphasis should be placed in this area. This is important, for while most educators know how to use media such as projectors, tape recorders, and television systems, few know when they should be used (Finn and Others, 1967). Instruction should be planned as a system to incorporate all of the media considered appropriate into a process which will result in the most efficient and effective learning situa-

tion. During this planning stage, publications similar to *Steps in Curriculum Construction* (1965) should be used as planning guides.

As was indicated earlier, much consideration appears to have been given to programmed instructional materials for food industry occupations. However, it is recommended that personnel continue to integrate programmed instruction into formal training programs as it reportedly conserves instructor time, provides for flexible scheduling for large and small groups, and aids in standardizing course content. Research involving the use of such materials generally has shown that this method can be an effective part of the teaching-learning process.

Methodology of Curriculum Development

In previous sections of this review and analysis, the need for educational programs, the availability of curricula and curriculum materials, and the techniques of curriculum development for food industry occupations have been examined. With this as a basis, one can make a prediction as to how curricula will be developed to prepare workers for their future work roles and how their skills and knowledge can be updated once they have entered an occupation.

It is possible and very probable that research being conducted at the present time will help to answer questions related to this preparation as they occur. However, the literature reviewed during the preparation of this analysis contained no material related to current projects of notable interest concerning curriculum development in food industry occupations.

Analyses for Curriculum Development

The lack of such research does not prevent the formulation of procedures for the development of curricula which will keep pace with change in food industry occupations. As a basis for such development, one must consider that "a realistic, functional curriculum depends upon an understanding of the needs and requirements of the occupational field. Determination of the elements of the occupation (the skills, knowledge, habits, and attitudes essential to employment) demand an occupational analysis" (Larson and Blake, 1969). Thus, some type of analysis will be used as the primary means of securing data necessary for curriculum development. The use of this analysis is possible because as Roney has indicated, "occupational education is based upon the premise that the factors contributing to success in an occupation are relatively well known and can be converted into certain educational experiences" (Larson and Blake, 1969).

The analyses described earlier will be expanded to create a zoned analysis of the occupations. According to Larson, zoned analysis is a method of graphic delineation which may be explained as a system through which factors involved in any organization or research project may be arranged in orderly sequence on an easy-to-understand chart (Larson and Blake, 1969). Such analysis proceeds from the general to the specific

according to a predetermined and definite plan. Examples of this technique as it might be used for several food industry occupations are presented in Crawford's publication, *A Competency Pattern Approach to Curriculum Construction in Distributive Teacher Education* (1969).

This technique, zoned analysis, will aid the developer in preparing curricula for various employment levels within an occupation or in preparing a total curriculum which employs the "ladder concept." Such a curriculum would have multi-exit points and contribute to worker mobility within an occupational area. An example of a foods educational program with multi-exit points is described in the report, *Project FEAST* (1967).

How can one analyze a job which is just emerging or is changing? Such a situation requires the complete cooperation of personnel in education and food industry occupation, for the analysis should begin as the change is introduced. Priore (1968) indicated that when the normal training patterns are disrupted by new processes, industry continues to fall back on on-the-job training. The innovation is demonstrated to the operator who then perfects the requisite skills while performing the job. This procedure is assumed to be true for innovations in food industry occupations.

For the educator to analyze the job during this introductory period, a communications network must be established and maintained with food industry personnel. Because the introduction of change is a highly variable process, a system should be developed to constantly monitor the occupation involved in an effort to detect change. If curricula were prepared on a national basis or even a state basis and then revised for relevance to students in a given school, such a monitoring system would be feasible. In addition, curricula prepared on these levels would increase the need for standards of instruction and student performance which could lead to improved programs.

It might be possible for educational specialists to develop this type of communications network by becoming involved in helping food industry personnel identify the job descriptions for emerging occupations. However, it is doubtful if such an analysis can begin until the job has actually been established. An attempt to generate job descriptions with the cooperation of job incumbents and supervisory personnel of related jobs proved to be inadequate (*Oregon Statewide Study of Systematic Vocational Education Planning, Implementation, Evaluation: Phase I—Manpower Needs, Data-Collection Devices and Occupational Clusters. Final Report,* 1967).

Systems Approach

When the curriculum is developed, one of the analyses will not be the sole basis for its development. The analyses described earlier will be incorporated into a systems approach.

Once the job is analyzed, performance objectives similar to those suggested by Mager (1962) and recommended by Tuckman (1969) will be formulated. Then the educational strategy to meet these objectives will be fixed along with selection criteria for the students (Miller, 1969). These selection criteria are important as the curriculum should be designed for

the types of persons as well as for the job or job cluster. In fact, Kurth stated that occupational analysis has two broad elements—competencies the worker has or brings to the job and competencies the occupation requires (Larson and Blake, 1969).

One systems approach to preparing students for an occupation is shown in Figure 1. This system includes provisions for the presentation and evaluation of instruction in addition to steps necessary for actual curriculum development. These additional steps, as should be noted from the arrows, are of value because they provide a feedback of information which may be used for curriculum improvement. In this system, the developers considered the type of student entering the program as part of step 6, select instruction strategy. The use of such a system in planning and conducting an educational program should lead to efficiency in training and better prepared individuals while it provides a means of constantly updating the training program. If such an approach is used, it should be designed to meet the requirements of the immediate situation.

Educational Curriculum and Curriculum Materials

Curricula must be developed to cope with the changes taking place in food industry occupations and the mobility of food industry workers. They must be developed to prepare potential workers for existing occupational opportunities as well as new and emerging occupational opportunities. Kurth has indicated that spiral curricula which ensure continuity and sequential learning of subject matter related to the students' interests and needs are of value (Larson and Blake, 1969). Such curricula may use multi-exit points so the students can leave the program with various skill and knowledge levels and then reenter the program to secure additional job preparation. Under this system, initial preparation will be provided in a cluster of occupations while training will become more specific as job placement approaches.

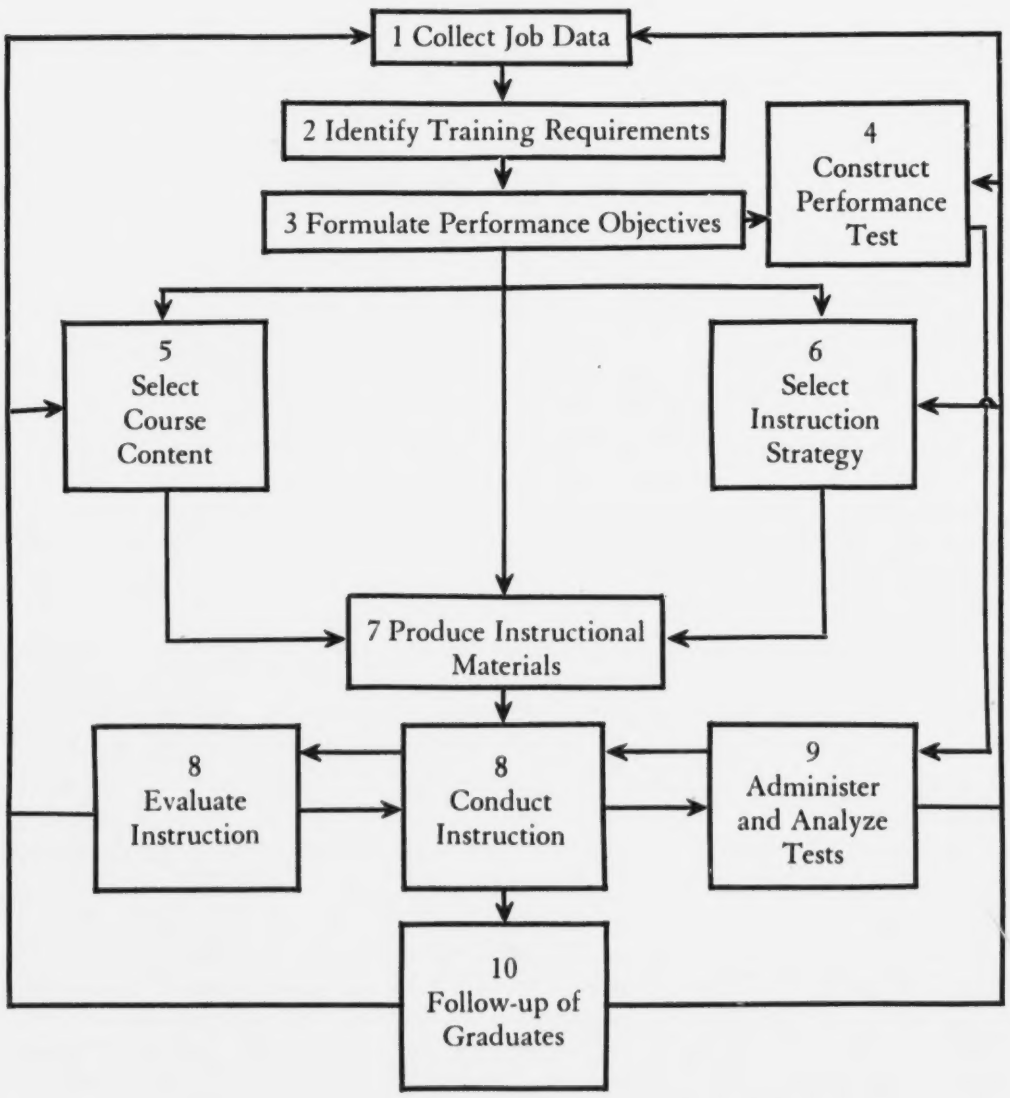
Occupational packets which include a curriculum, transparencies, equipment lists and specifications, a list of supplies, budgets, a biliography, and current reference material should be prepared. Such preparation and packaging is especially important for those occupations with fewer workers and in which few materials are available and few training programs are provided as there may be little interest in developing the needed materials. In addition, an evaluation process should be devised to ensure the value of these materials and to determine the value of materials already available.

In the preparation of these materials, consideration should be given to the use of media such as television systems, computers, projectors, and tape recorders, and how they can contribute to the educational program. Such techniques as individually paced or programmed instruction and simulation also require consideration in future training programs.

Counseling Students

Counselors should have data which will indicate the degree to which aptitudes and interests of students are similar to those of individuals who

FIGURE 1
A SYSTEMS APPROACH TO OCCUPATIONAL TRAINING*



*W. R. Tracey, E. B. Flynn, and C. L. J. Legere, "Systems Approach Gets Results," *Training in Business and Industry,* IV (June, 1967), pp. 17-21, 32-38.

have completed a given trade or industrial curriculum as well as persons who have successfully pursued related occupations for several years and have shown a reasonably good level of job proficiency (Doerr and Ferguson, (1968). Such data will increase in value as changes occur within the occupations, and a means of providing this type of information and keeping it current should be established within the educational community.

Performance proficiency measurements and standards which are now lacking should be considered as requirements in the educational program. Proficiency measurements will provide a means of measuring student progress or the lack thereof and serve as a basis for counseling. Proficiency standards would help in determining the degree to which the student has achieved skills and knowledge necessary for entry into and performance in an occupation. Such measurements and standards are expected to play an important role in preparing training programs for minority groups though they are lacking in present curricula.

Summary

Providing high quality food in adequate amounts to all the American people is a goal that cannot be achieved where serious shortages of food industry personnel exist. In attempting to alleviate these shortages, it is unreasonable to expect a neat balance between training completions and job openings. While educators and food industry personnel should attempt to train enough workers to fill the positions, primary emphasis should be directed toward preparing the individual for work. To do this, a curriculum based on some type of analysis, student interests and needs, and the philosophy and objectives of the local school is required.

Curricula for food industry occupations will be developed and evaluated through an educational planning system. This planning will involve four major steps: occupational analysis, program planning, program development and testing, and documentation and dissemination of the results (Roney, 1967). At this time, it appears that personnel interested in education for food industry occupations have been able to perform these steps in a satisfactory manner. While curricula and curriculum materials generally are available for those occupations recognized at the present time, improvements are needed and changes will be necessary. System changes for the future will involve placing additional emphasis on each of the four steps and employing stricter controls and guidelines. Special consideration will be given to occupational analysis and dissemination of the results. While these four steps are important, it should be remembered that curriculum development starts with a job and ends with a student on the job, technically competent and able to succeed (Shoemaker in *Technical Education for the Seventies.* 1969).

New curricula alone are not enough. To provide and train the necessary workers, improved counseling and recruiting materials are required along with improved uses of curriculum materials and teaching techniques. Efforts must be made to attract additional individuals from all groups to meet future worker requirements. Additional research should be conducted

to relate scientific change and the responsiveness of food industry education curricula.

In addition to these improvements, other changes must be made. Presently operating programs should be expanded to meet future needs. Offerings in high school programs should be increased and additional programs should be initiated for post-high school students as rapidly as is feasible.

No educational system can supply the relevant level of skills and competencies required without receiving active feedback and support from persons associated with the related occupation (Kraft, 1969). Because of this, a systems approach not only should be used in developing curricula but also for providing instruction. Future curriculum development and instruction require that a complete and flexible communications network be established among all those affected by the educational program.

DESCRIPTION OF THE BIBLIOGRAPHY

Compilation

References believed to be of value to persons desiring information concerning curricula for food industry occupations were identified through a search of both Educational Resources Information Center (ERIC) publications and non-ERIC publications. ERIC publications included:

Abstracts of Instructional Materials in Vocational and Technical Education (AIM), Fall 1967—Spring 1970.

Abstracts of Research and Related Materials in Vocational and Technical Education (ARM), Fall 1967—Spring 1970.

Current Index to Journals in Education, Volume I; Volume II, Numbers 1-3.

Manpower Research: Inventory for Fiscal Years 1966 and 1967.

Manpower Research: Inventory for Fiscal Year 1968.

Research in Education (RIE), Volumes I-IV; Volume V, Numbers 1-7.

The three non-ERIC sources of information which were searched were:

CIRF Abstracts. Geneva, Switzerland: The International Vocational Training Information and Research Centre, C/O The International Labor Organization, Volume I-VIII; Volume IX, First Dispatch (February, 1970).

Corplan Associates of IIT Research Institute. *A Bibliography of Published and Unpublished Vocational and Technical Education Literature.* Illinois: Research Coordinating Unit, Vocational and Technical Education Division and State of Illinois, Board of Vocational Education and Rehabilitation, 1966.

Ehrenreich, Julia W., ed. *Education Index.* New York: The H. W. Wilson Company, July 1964—May 1970.

While some of the later *Research in Education* indexes were searched manually by the writer, most were searched by computer. The remaining publications were searched manually by senior-level staff of The Center for Vocational and Technical Education, The Ohio State University, and/or by the writer. ERIC descriptors and strategies adapted from the *Thesaurus of ERIC Descriptors* and used in the searches are outlined below:

Analysis	*and Food*
or Curriculum	or Meat
or Educational Needs	
or Employment Qualifications	
or Instruction	
or Job Skills	

An additional search was made of the *Research in Education* indexes by computer in an attempt to identify material related to curricula development in food industry occupations. ERIC descriptors and strategies adapted from the *Thesaurus of ERIC Descriptors* and used in the search are outlined below:

Curriculum Design	*and Agricultural Education*
or Curriculum Development	or Cooperative Education
or Curriculum Planning	or Distributive Education
	or Health Occupations
	or Home Economics
	or Industrial Education
	or Job Training
	or Technical Education
	or Vocational Agriculture
	or Vocational Education

In addition to these searches of specific sources, a cursory search was made of related materials available in the library of The Center for Vocational and Technical Education.

Organization

The limited bibliography prepared as a result of these searches and a selection process was organized into two sections, literature identified from ERIC sources and that identified from non-ERIC sources. Publications identified through the cursory search of library materials were placed into one of these sections on the basis of whether they were listed in the ERIC publications reviewed earlier. If the materials identified were not listed in these publications, they were classified as from non-ERIC sources.

These sections were then divided into five subsections for ease of use. Items listed in each of these subsections were arranged alphabetically by author or title. The five subsections selected were:

Need for educational programs.—Materials cited in this section contained information related to the need for trained manpower in food industry occupations and the types of programs through which training is provided.

Curricula and curriculum materials.—This section includes citations which concern education in food industry occupations. These citations include material concerning program descriptions, course content, and instructional materials suitable for secondary and post-secondary programs.

Curriculum development.—Documents listed in this section are those which deal with or are related to some aspect of curriculum development in food industry occupations such as related research reports and projects and needed revisions.

Methodology of curriculum development.—This section of the bibliography contains documents concerning the procedures or methods which have applicability to curriculum development for food industry occupations which will be important during the next decade.

Information sources.—Publications cited in this section of the bibliography are those which were searched in an attempt to obtain relevant material or which contain information of a general nature related to food industry occupations.

While the biliographic entries were placed into categories, such categorization is not meant to be exclusive. The various publications were listed in only one category, not in several categories. Because of this, references in categorical areas related to the area of one's primary interest should be consulted for possible additional information.

Entries were selected on the basis of a review for their applicability to curricula in food industry occupations. It was believed that the entries included in the bibliography were representative of the materials available in relation to this topic and will provide a basic orientation to these occupations.

Availability of Documents

Publications and documents identified as pertinent to this review and analysis and listed in the bibliography may be secured through many sources. However, for easier access to these items, certain sources should be considered.

ERIC publications from which literature was identified may be determined by the prefix to the identifying document number. Prefixes found in this bibliography are:

Prefix	*Publication*
ED	RIE
EJ	CIJE
MP	Manpower Inventory
VT	AIM, ARM

Most ED and MP documents are available on microfiche (MF) or hard copy (HC) from the ERIC Document Reproduction Service (EDRS).

EDRS prices cited in this bibliography reflect pricing in effect at the time of publication. Recent price schedules and ordering information available in the current issue of *AIM, ARM,* or *Research in Education* should be consulted prior to placing an order.

CIJE entries usually can be found in periodicals which are available in local libraries. Items with a VT prefix generally can be found on microfiche in a VT-ERIC set which is available in many libraries or which may be ordered from EDRS. ED, MP, and VT items not available on microfiche or hard copy from EDRS may be secured from other sources which are listed in the bibliography.

Publications and documents not listed as ERIC publications should be secured through local libraries or from the publisher.

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